MMR

MORBIDITY AND MORTALITY WEEKLY REPORT

297 Hepatitis A Among Drug Abusers 805 Human Rabies — California, 1987

Epidemiologic Notes and Reports

Hepatitis A Among Drug Abusers

Over the past several years, CDC has received an increasing number of reports of hepatitis A outbreaks involving drug abusers. These outbreaks have occurred in many areas of the United States, including Alaska, Oregon, Washington State, northern and southern California, Oklahoma, upstate New York, and Connecticut. A variety of drugs have been used: in Oregon, northern California, and Oklahoma, intravenous (IV) amphetamines have been most commonly implicated; in one locality in southern California, a new form of heroin, referred to as "black tar" because of its color and consistency, has been linked with transmission; in upstate New York, IV cocaine has been the primary drug. In several areas, cases have occurred among people who only smoked marijuana. Outbreaks in upstate New York and northern California and data from the Viral Hepatitis Surveillance Program (VHSP)* are summarized below to illustrate this trend.

Upstate New York

Since December 1, 1986, hepatitis A outbreaks predominantly involving drug abusers have been reported in Monroe, Cortland, Onondaga, and Chemung counties in upstate New York. In Monroe County, 87 cases of physician-diagnosed hepatitis A were reported to local health authorities between December 1, 1986, and May 31, 1987. An average of nine cases had been reported for the same period of the previous 2 years. Twenty-four (28%) of these patients were IV drug abusers without other identifiable risk factors for hepatitis A. Eight additional patients were sexual or household contacts of these 24 patients. Information about the specific drugs used was not available for all patients; however, local drug enforcement officials believe that cocaine is the primary drug used intravenously in Monroe County.

Thirty-eight cases of hepatitis A occurred in Cortland County in 1987. Twenty-two (58%) of the patients were known or suspected drug abusers. Eleven of these cases occurred between March 25 and April 18. About 1 month before becoming ill, these 11 patients had attended two different social gatherings at which seven of them had used IV cocaine and shared needles. No food was consumed nor were beverages shared at these gatherings, and no other risk factors for hepatitis A could be identified.

^{*}A nationwide reporting system in which patients serologically confirmed to have hepatitis A are interviewed to identify probable sources of illness.

Increases in hepatitis A also occurred in Onondaga and Chemung Counties during 1987. Fifty (38%) of the 131 cases of hepatitis A in Onondaga County in 1987 were among known or suspected drug abusers; 70% of the 50 patients used only IV cocaine. Thirteen cases occurred between October and December in Chemung County. Four (31%) of these patients were drug abusers; all used IV cocaine only. Anecdotal information suggested that drug abusers in Chemung County had recently obtained cocaine from persons in Onondaga County.

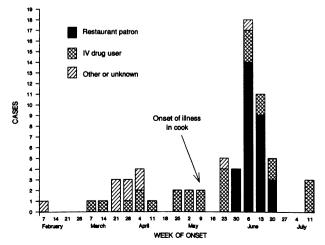
Northern California

In June 1987, an outbreak of hepatitis A among patrons of a restaurant in a northern California county was reported to local health authorities. Investigation revealed that a restaurant cook with a history of IV drug abuse had been diagnosed with hepatitis A several weeks earlier. A review of all serologically confirmed cases of hepatitis A in the county between January 1 and June 30, 1987, was subsequently conducted. Thirty (42%) of the 71 cases identified were associated with the foodborne outbreak originating at the restaurant (Figure 1). Thirty-three of the remaining 41 patients were contacted either directly or through friends or family. Twenty-four (73%) of these 33 patients were IV drug abusers and did not have other risk factors for hepatitis A. Eleven (46%) of the IV drug abusers were male; all were white; and they ranged from 21 to 39 years of age. Twelve of the drug abusers admitted to IV drug use within 6 weeks before onset of hepatitis A. All twelve had injected "crank" (an amphetamine derivative). Twelve of the IV drug abusers admitted to either casual or intimate contact or sharing needles or drug paraphernalia with at least one other IV drug abuser who contracted hepatitis A during the same period.

Viral Hepatitis Surveillance Program

Data from VHSP indicate an increasing association between drug abuse and hepatitis A in the United States. Between 1982 and 1986, the percentage of persons with hepatitis A who admitted to previous IV drug use rose steadily from 4% to 19%. During this period, overall hepatitis A rates were relatively constant, and the proportion of patients with hepatitis A who had other identifiable risk factors remained stable. It should be noted, however, that only one-third of patients reported

FIGURE 1. Cases of hepatitis A, by week of onset - northern California, 1987



to the MMWR Morbidity Surveillance System were interviewed through VHSP and that only a modest proportion of such persons are routinely asked about IV or other drug use.

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Editorial Note: In the United States, transmission of hepatitis A has traditionally been associated with crowding, poor personal hygiene, improper sanitation, and, less commonly, contamination of food or water. Recognized risk factors include intimate or close contact with persons with hepatitis A, foreign travel to developing countries, and contact with children in day-care centers.

The association of drug use and hepatitis A has been recognized only recently. Well-documented outbreaks of hepatitis A among drug abusers have been reported in Scandinavian countries (1,2). In seroprevalence studies of antibodies against hepatitis A virus (HAV) in Denmark, drug abusers have had antibody rates four times those of the general population (3).

Two possible explanations for the association between hepatitis A and drug use have been proposed: 1) HAV may be transmitted by injection or ingestion[†] of contaminated drugs (common-source spread), or 2) transmission may result from direct person-to-person contact. The culture of fecal coliforms from marijuana confiscated during one investigation (Alaska Department of Health and Social Services, unpublished data) raises the possibility that direct contamination of drugs could be a factor in some of these outbreaks. Drugs could become contaminated with fecal material containing HAV at the cultivation site (e.g., through use of human feces as fertilizer) or during transport, preparation, or distribution (e.g., through smuggling in condoms concealed in the rectum [4] or in baby diapers). However, the pattern of occurrence of the cases by dates of onset in each of the outbreaks and the diversity of drugs involved argue against a single common-source mode of transmission. Nevertheless, sustained common-source transmission is possible if contaminated drugs were distributed among persons who then used them at different times.

Person-to-person transmission of HAV between drug abusers could result from sharing needles, from sexual contact, or from generally poor sanitary and personal hygiene conditions, which have often been observed among drug abusers. Isolated instances of bloodborne transmission resulting from transfusions from donors who had given blood during the incubation period of viral infection have been reported. Due to the relatively short viremic phase of HAV infection, however, bloodborne

[†]By tasting the drug to assess quality, for example.

⁵HÁV could not, however, be isolated from the marijuana by tissue culture (CDC, unpublished data).

transmission through needle-sharing is unlikely to have sustained large outbreaks such as those reported here, although it may have accounted for one cluster in Cortland County.

Investigations of the various outbreaks to date have not revealed clear modes of transmission. It is possible that each outbreak has multiple modes of transmission. Physicians and public health authorities are strongly urged to identify and investigate hepatitis outbreaks among drug abusers. Clinicians evaluating persons with a history of drug use for viral hepatitis should obtain serologic tests for both hepatitis A and B. Public health officials should ask persons with hepatitis A about drug use and include such information on the VHSP questionnaires. Control measures include the use of good sanitation and personal hygiene and the administration of immune globulin to contacts of patients within 2 weeks of exposure. Factors operating in communities of drug abusers, such as poor hygienic conditions and transience as well as the relatively poor responsiveness of such groups to education and preventive efforts, make outbreaks among these groups difficult to control.

(Continued on page 305)

TABLE I. Summary - cases of specified notifiable diseases, United States

| | 19 | th Week End | ing | Cumulative, 19th Week Ending | | | | |
|---|-------------------|-------------------|---------------------|------------------------------|-----------------------|---------------------|--|--|
| Disease | May 14, 1988 | May 16, 1987 | Median 1983-1987 | May 14, 1988 | May 16, 1987 | Median 1983-1987 | | |
| Acquired Immunodeficiency Syndrome (AIDS) Aseptic meningitis Encephalitis: Primary (arthropod-borne | 590 80 | U * 84 | 168 84 | 11,185 1,371 | 6,791 1,683 | 2,463 1,524 | | |
| & unspec) Post-infectious Gonorrhea: Civilian | 14 2 10,912 | 17 3 14,964 | 17 3 14,964 | 228 33 241,018 | 313 29 | 313 37 | | |
| Military | 251 416 | 364 463 | 364 | 4,499 | 291,882 6,358 | 301,088 7,538 | | |
| Hepatitis: Type A Type B Non A, Non B | 416 428 45 | 463 490 63 | 411 500 76 | 8,688 7,486 887 | 9,078 9,180 | 8,067 9,037 | | |
| Unspecified Legionellosis | 25 24 | 45 | 107 13 | 774 271 | 1,150 1,185 302 | 1,261 1,812 | | |
| Leprosy Malaria | 5 11 | 19 3 16 | 14 12 | 69 234 | 76 257 | 230 101 257 | | |
| Measles: Total [†] Indigenous | 105 97 | 320 289 | 108 96 | 1,029 923 | 1,784 1,564 | 1,237 1,100 | | |
| Imported Meningococcal infections | 8 64 | 31 59 | 13 61 | 106 1,335 | 220 1,388 | 137 1,284 | | |
| Mumps Pertussis | 246 23 | 474 41 | 93 32 | 2,111 760 | 7,423 631 | 1,529 654 | | |
| Rubella (German measles) Syphilis (Primary & Secondary): Civilian | 672 | 21 669 | 24 489 | 74 13,566 | 139 12,164 | 187 10,279 | | |
| Military Toxic Shock syndrome | 3 8 | 4 7 | 4 7 | 71 107 | 72 115 | 83 146 | | |
| Tuberculosis Tularemia | 392 2 | 366 5 | 389 4 | 6,795 33 | 7,156 43 | 7,214 38 | | |
| Typhoid Fever Typhus fever, tick-borne (RMSF) | 8 | 11 5 | 6 10 | 132 30 | 109 37 | 109 59 | | |
| Rabies, animal | 77 | 118 | 118 | 1,457 | 1,828 | 1,828 | | |

TABLE II. Notifiable diseases of low frequency, United States

| | Cum. 1988 | | Cum. 1988 |
|---|------------------------------|---|------------------------------------|
| Anthrax Botulism: Foodborne Infant Other Brucellosis (Ark. 1, Okla. 1) Cholera Congenital rubella syndrome (Ore. 1) Congenital syphilis, ages < 1 year Diphtheria | 4 14 2 20 - 3 | Leptospirosis Plague Poliomyelitis, Paralytic Psittacosis Rabies, human Tetanus (Mich. 1) Trichinosis | 10 1 - 26 - 16 8 |

^{*}Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.

'Eight of the 105 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending May 14, 1988 and May 16, 1987 (19th Week)

| | T | Aseptic | Encep | halitis | | | Н | epatitis | type | | | |
|---------------------------|--------------|-----------------|--------------|----------------------|------------------|------------------|--------------|--------------|--------------|------------------|--------------------|--------------|
| Reporting Area | AIDS | Menin- gitis | Primary | Post-in- fectious | (Civ | orrhea ilian) | Α | В | NA,NB | Unspeci- fied | Legionel- losis | Leprosy |
| | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 |
| UNITED STATES | 11,185 | 1,371 | 228 | 33 | 241,018 | 291,882 | 8,688 | 7,486 | 887 | 774 | 271 | 69 |
| NEW ENGLAND | 474 | 63 | 10 | - | 7,294 | 9,730 | 310 | 467 | 76 | 41 | 13 | 10 |
| Maine | 15 | 5 | 1 | - | 165 | 304 | 13 | 21 | 4 | 1 | 2 | - |
| N.H. Vt. | 12 3 | 10 3 | 3 | - | 111 60 | 165 72 | 25 4 | 22 14 | 4 5 | 3 | 1 | - |
| Mass. | 264 | 26 | 5 | - | 2,578 | 3,619 | 163 | 296 | 51 | 32 | 7 | 9 |
| R.I. | 22 | 15 | : | - | 658 | 798 | 42 | 50 | 8 | | 2 | 1 |
| Conn. | 158 | 4 | 1 | - | 3,722 | 4,772 | 63 | 64 | 4 | 5 | • | • |
| MID. ATLANTIC | 3,811 546 | 162 89 | 26 | : | 37,392 4,896 | 45,663 | 520 323 | 952 265 | 56 | 78 | 59 31 | 6 |
| Upstate N.Y. N.Y. City | 2,100 | 26 | 16 5 | - | 16,400 | 5,919 24,079 | 90 | 429 | 31 4 | 8 54 | 8 | 5 |
| N.J. | 818 | 47 | 5 | - | 5,400 | 5,814 | 99 | 247 | 21 | 16 | - | 1 |
| Pa. | 347 | - | - | • | 10,696 | 9,851 | 8 | 11 | - | - | 20 | - |
| E.N. CENTRAL | 839 | 172 | 43 | 2 | 38,286 | 42,112 | 448 | 727 | 44 | 43 | 67 | • |
| Ohio | 182 | 68 | 17 8 | 2 | 9,156 | 8,786 | 128 | 199 | 15 | 7 | 24 | • |
| ind. III. | 62 385 | 29 5 | | : | 3,028 11,005 | 3,412 12,951 | 57 51 | 118 44 | 5 | 15 3 | 5 | - |
| Mich. | 178 | 62 | 13 | - | 12,397 | 13,174 | 148 | 283 | 17 | 18 | 28 | - |
| Wis. | 32 | 8 | 5 | • | 2,700 | 3,789 | 64 | 83 | 7 | - | 10 | - |
| W.N. CENTRAL | 225 | 66 | 14 | 3 | 9,609 | 11,949 | 542 | 380 | 38 | 14 | 28 | - |
| Minn. | 42 | 13 | 2 7 | - | 1,352 750 | 1,896 | 24 29 | 51 36 | 5 7 | 3 | 8 | • |
| lowa Mo. | 13 113 | 13 20 | <i>'</i> . | : | 5,369 | 1,112 6,093 | 311 | 232 | 19 | 6 | 4 | : |
| N. Dak. | | - | - | | 57 | 128 | 2 | 3 | 1 | š | 1 | - |
| S. Dak. | 3 | 5 | : | 1 | 195 | 233 | | 1 | 2 | • | 9 | - |
| Nebr. Kans. | 16 38 | 3 12 | 2 3 | 2 | 578 1,308 | 720 1,767 | 18 158 | 19 38 | 4 | 2 | 4 2 | : |
| | | | - | 40 | | | | | | | | |
| S. ATLANTIC Del. | 1,709 17 | 315 8 | 33 2 | 13 | 68,616 974 | 76,829 1,127 | 751 12 | 1,563 43 | 121 4 | 117 1 | 51 5 | 1 |
| Md. | 182 | 32 | 4 | 2 | 7,064 | 8,542 | 102 | 242 | 9 | 5 | ğ | 1 |
| D.C. | 170 | 8 | .: | 1 | 4,705 | 5,162 | . 7 | 21 | 3 | 1 | : | • |
| Va. W. Va. | 126 6 | 37 7 | 14 1 | 2 | 4,704 554 | 5,825 589 | 154 6 | 108 25 | 28 2 | 79 3 | 5 | • |
| N.C. | 108 | 51 | 9 | | 11,140 | 11,742 | 143 | 279 | 29 | - | 16 | - |
| S.C. | 60 | 4 | : | 1 | 5,082 | 6,354 | 25 | 225 | 6 | 3 | 5 | • |
| Ga. Fla. | 241 799 | 38 130 | 1 2 | 7 | 13,617 20,776 | 13,066 24,422 | 133 169 | 250 370 | 7 33 | 2 23 | 5 6 | : |
| | | 91 | 21 | 5 | 18,650 | 21,230 | 348 | 470 | 65 | 6 | 8 | 1 |
| E.S. CENTRAL Ky. | 301 35 | 34 | 6 | 1 | 1,541 | 2,177 | 309 | 90 | 29 | 2 | 4 | |
| Tenn. | 144 | 10 | 5 | - | 6,202 | 7,368 | 24 | 231 | 17 | - | 2 | - |
| Ala. | 76 | 36 | 10 | 2 | 6,246 | 6,756 | 5 | 122 | 16 | 4 | 2 | 1 |
| Miss. | 46 | 11 | • | 2 | 4,661 | 4,929 | 10 | 27 | 3 | • | • | • |
| W.S. CENTRAL | 864 34 | 131 3 | 15 2 | | 27,161 2,522 | 33,353 3,268 | 879 112 | 565 32 | 71 1 | 185 4 | 9 2 | 12 |
| Ark. La. | 142 | 22 | 2 | : | 5,694 | 6,060 | 50 | 128 | 11 | 7 | 3 | : |
| Okla. | 35 | 11 | 4 | - | 2,481 | 3,629 | 214 | 69 | 17 | 16 | 4 | - |
| Tex. | 653 | 95 | 7 | • | 16,464 | 20,396 | 503 | 336 | 42 | 158 | - | 12 |
| MOUNTAIN | 379 | 61 | 18 | 1 | 5,089 | 7,757 | 1,224 | 603 | 90 | 84 | 16 | • |
| Mont. | 5 | 2 | - | - | 151 147 | 185 269 | 20 59 | 23 35 | 4 2 | 3 | - | - |
| ldaho Wyo. | 3 1 | 1 | | : | 91 | 152 | 1 | 35 4 | 3 | 1 | i | : |
| Colo. | 140 | 23 | 3 | | 1,137 | 1,645 | 83 | 78 | 13 | 39 | 4 | - |
| N. Mex. | 19 | 2 | 1 | - | 498 | 830 | 211 | 76 | 5 | 1 | 1 | - |
| Ariz. | 129 32 | 19 7 | 5 4 | 1 | 1,744 231 | 2,745 248 | 639 132 | 255 51 | 38 18 | 25 11 | 7 2 | - |
| Utah Nev. | 50 | 6 | 5 | | 1,090 | 1,683 | 79 | 81 | 7 | 4 | ī | - |
| PACIFIC | 2.583 | 310 | 48 | 9 | 28,921 | 43,259 | 3,666 | 1,759 | 326 | 206 | 20 | 39 |
| Wash. | 146 | - | 2 | 4 | 2,190 | 3,184 | 806 | 238 | 56 | 20 | 6 | 2 |
| Oreg. | 77 | - | .: | ÷ | 1,099 | 1,659 | 643 | 242 | 32 | 10 | - | - |
| Calif. | 2,313 9 | 276 7 | 44 1 | 5 | 24,969 397 | 37,386 665 | 2,105 108 | 1,228 33 | 234 3 | 170 3 | 12 | 33 1 |
| Alaska Hawaii | 38 | 27 | i | | 266 | 365 | 4 | 18 | 1 | 3 | 2 | 3 |
| | | | | | 41 | 72 | 3 | 3 | _ | 2 | | 3 |
| Guam P.R. | 496 | 11 | 2 | | 552 | 825 | 12 | 100 | 20 | 20 | | - |
| v.i. | 9 | - | - | - | 152 | 88 | 1 | 3 | - | - | - | - |
| | | - | | _ | 14 | 37 | - | 1 | | | - | - |
| Amer. Samoa C.N.M.I. | - | - | - | _ | 16 | • | 1 | 2 | | 4 | - | = |

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 14, 1988 and May 16, 1987 (19th Week)

| May 14, 1988 and May 16, 1987 (19th Week) | | | | | | | | | | | | | | | |
|---|--------------|----------|---------------|----------|--------------------------------|--------------|----------------------------|------------|--------------|-----------|--------------|--------------|---------|--------------|--------------|
| | Malaria | India | Meas enous | | es (Rubeola) Imported* Tota | | Menin- gococcal | Mumps | | Pertussis | | | Rubella | | |
| Reporting Area | Cum. 1988 | 1988 | Cum. 1988 | 1988 | Cum. 1988 | Cum. 1987 | Infections Cum. 1988 | 1988 | Cum. 1988 | 1988 | Cum. 1988 | Cum. 1987 | 1988 | Cum. 1988 | Cum. 1987 |
| UNITED STATES | 234 | 97 | 923 | 8 | 106 | 1,784 | 1,335 | 246 | 2,111 | 23 | 760 | 631 | 2 | 74 | 139 |
| NEW ENGLAND | 20 | 17 | 19 | 2 | 46 | 141 | 112 | 7 | 31 | - | 700 | 17 | | 1 | 1 |
| Maine N.H. | 2 | 12 | 13 | 1† | 44 | 3 112 | 3 13 | 7 | 27 | • | 11 22 | 1 2 | • | : | i |
| Vt. Mass. | 13 | - | - | - | - | 9 | 5 | <i>'</i> - | 1 | - | 1 | 3 | : | : | :_ |
| R.I. | 3 | : | 1 | - | : | 5 | 47 19 | : | 3 | - | 33 1 | 4 | : | 1 | |
| Conn. MID. ATLANTIC | 2 29 | 5 51 | 5 281 | 1† | 2 4 | 12 | 25 | - | - | • | 9 | 7 | • | - | - |
| Upstate N.Y. | 13 | 2 | 4 | 1 | 2 | 311 18 | 125 60 | 26 1 | 205 40 | 11 11 | 35 21 | 85 66 | : | 7 1 | 5 3 |
| N.Y. City N.J. | 9 5 | 2 | 25 12 | 1† | 1 1 | 247 9 | 19 45 | 25 - | 75 24 | : | 1 3 | 4 | : | 4 1 | 1 |
| Pa. | 2 | 47 | 240 | • | - | 37 | 1 | • | 66 | - | 10 | 15 | - | 1 | - |
| E.N. CENTRAL Ohio | 11 2 | : | 43 | 1 | 13 3 | 228 5 | 140 52 | 40 5 | 492 68 | 2 | 83 21 | 83 26 | 1 - | 21 | 19 |
| ind. III. | - | : | - 31 | - 1† | 9 | 88 | 18 6 | - 29 | 39 181 | : | 38 2 | 1 5 | i | 17 | 18 |
| Mich. Wis. | 8 1 | - | 12 | - | 1 | 23 112 | 46 18 | 6 | 139 65 | - | 16 | 24 | ÷ | 4 | 1 |
| W.N. CENTRAL | 6 | | | | | 100 | 55 | 2 | 99 | • | 6 35 | 27 35 | • | • | 1 |
| Minn. | 2 | - | - | - | - | 9 | 14 | - | 25 | - | 5 | 7 | • | - | - |
| Mo. | 3 | : | - | - | : | 89 | 21 | 1 | 26 | : | 14 5 | 3 13 | : | : | 1 |
| N. Dak. S. Dak. | - | : | : | - | : | 1 - | i | - | : | - | 6 2 | 2 2 | : | - | • |
| Nebr. Kans. | ī | - | : | : | - | 1 | 6 13 | 1 | 11 37 | • | 3 | 8 | - | : | - |
| S. ATLANTIC | 33 | 12 | 207 | - | 10 | 47 | 231 | 87 | 254 | 1 | 66 | 127 | | 1 | 9 |
| Del. Md. | 3 | - | 2 | : | 2 | 1 | 1 23 | 12 | 21 | 1 | 3 17 | 2 | • | : | 2 |
| D.C. Va. | 5 7 | 12 | 113 | - | 2 | 1 | 7 28 | 19 52 | 93 81 | - | 7 | 33 | • | - | - |
| W. Va. | , 6 | '- | 6 | - | - | - | 38 | - | 5 | - | | 19 | : | : | 1 |
| N.C. S.C. | 3 | : | : | - | 1 - | - | 28 | 1 | 23 3 | : | 24 | 55 - | - | - | - |
| Ga. Fla. | 2 7 | - | 86 | : | - 5 | 45 | 36 70 | 1 | 12 16 | : | 14 1 | 13 5 | | 1 | 1 5 |
| E.S. CENTRAL | 4 | 4 | 32 | - | - | 2 | 125 | 34 | 302 | 1 | 12 | 7 | | | 2 |
| Ky. Tenn. | - | - | 23 | - | - | - | 20 77 | 32 2 | 122 171 | - | 8 | 1 | • | : | 2 |
| Ala. Miss. | 3 1 | <u>.</u> | 9 | - | • | 2 | 20 8 | Ň | 6 N | 1 | 3 | 3 | - | - | - |
| W.S. CENTRAL | 23 | - | 9 | _ | - | 136 | 90 | 32 | 359 | 1 | 35 | 41 | • | 4 | - 2 |
| Ark. La. | 3 | - | | - | - | - | 11 28 | 15 | 3 146 | 1 | 5 | 2 9 | • | 3 | ī |
| Okla. | 5 | - | 8 | - | - | 1 | 8 | 9 | 115 | - | 24 | 30 | : | 1 | - |
| Tex. MOUNTAIN | 15 11 | 3 | 1 116 | 1 | 1 | 135 312 | 43 39 | 8 9 | 95 116 | - 5 | 283 | 66 | • | - | 1 |
| Mont. | 'i | - | • | - | - | 42 | - | - | 2 | - | 1 | 2 | - | 3 | 15 - |
| ldaho Wyo. | - | - | : | 1† | 1 | : | 3 | - | 1 2 | 4 | 233 1 | 25 2 | : | - | 1 |
| Colo. N. Mex. | 5 1 | 3 | 116 | - | • | 267 | 10 8 | N | 23 N | 1 | 8 1 | 17 3 | : | 2 | - |
| Ariz. Utah | 2 | - | - | - | - | 2 | 10 7 | 8 | 76 3 | - | 19 19 | 16 1 | - | - | 4 |
| Nev. | i | - | - | - | - | 1 | í | | 9 | - | 1 | | : | 1 | 9 |
| PACIFIC Wash. | 97 7 | 10 | 216 | 3 | 32 | 507 1 | 418 33 | 9 2 | 253 14 | 2 1 | 134 29 | 170 25 | 1 | 37 | 85 |
| Oreg. | 6 | - | ! | <u>.</u> | | 34 | 21 | N | N | - | 3 | 14 | - | : | 1 |
| Calif. Alaska | 82 2 | 9 | 214 | 1† | 29 | 468 | 346 5 | 6 | 231 5 | 1 - | 80 3 | 73 3 | 1 | 33 | 62 |
| Hawaii | - | 1 | 1 | 2† | 3 | 4 | 13 | 1 | 3 | - | 19 | 55 | - | 4 | 22 |
| Guam P.R. | 1 | | 159 | - | 1 | 2 406 | 6 | - | 2 5 | 1 | 6 | 11 | - | 1 | 1 1 |
| V.I. Amer. Samoa | - | - | | - | - | - | - | 1 | 13 | - | : | • | • | - | ÷ |
| C.N.M.I. | - | - | : | - | - | - | - | : | 1 | - | : | - | : | | - |

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 14, 1988 and May 16, 1987 (19th Week)

| Reporting Area | | (Civilian) Secondary) | Toxic- shock Syndrome | Tuber | culosis | Tula- remia | Typhoid Fever | Typhus Fever (Tick-borne) (RMSF) | Rabies, Animal | |
|---------------------------|--------------|--------------------------|-----------------------------|--------------|--------------|----------------|------------------|--|-------------------|--|
| | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1988 | Cum. 1987 | Cum. 1988 | Cum. 1988 | Cum. 1988 | Cum. 1988 | |
| UNITED STATES | 13,566 | 12,164 | 107 | 6,795 | 7,156 | 33 | 132 | 30 | 1,457 | |
| NEW ENGLAND | 376 | 188 | 9 | 133 | 204 | 1 | 9 | - | 3 | |
| Maine N.H. | 5 4 | 1 2 | 1 3 | 3 | 14 5 | - | - | - | 1 2 | |
| Vt. | - | 1 | 2 | | 4 | : | <u>:</u> | - | - | |
| Mass. R.I. | 159 12 | 91 5 | 3 | 85 11 | 93 23 | 1 - | 7 | - | - | |
| Conn. | 196 | 88 | - | 34 | 65 | - | 2 | - | - | |
| MID. ATLANTIC | 2,781 | 2,160 | 17 | 1,252 | 1,301 | • | 19 | 2 1 | 149 | |
| Upstate N.Y. N.Y. City | 156 1,829 | 79 1,512 | 8 2 | 206 568 | 200 638 | - | 2 8 | i | 1 | |
| N.J. | 309 487 | 239 330 | 3 4 | 227 251 | 222 241 | - | 9 | - | 148 | |
| Pa. | 422 | 350 351 | 16 | 805 | 838 | 1 | 14 | • | 30 | |
| E.N. CENTRAL Ohio | 422 | 39 | 13 | 145 | 175 | - | 4 | : | 30 | |
| Ind. | 21 | 18 | - | 86 | 83 | - | 2 | • | 7 | |
| III. Mich. | 222 124 | 201 62 | 3 | 319 206 | 344 207 | i | 6 1 | • | 6 4 | |
| Wis. | 11 | 31 | - | 49 | 29 | • | 1 | - | 13 | |
| W.N. CENTRAL | 90 | 55 | 13 | 181 | 202 | 15 | 4 | 4 | 181 | |
| Minn. lowa | 8 10 | 5 9 | 2 | 31 14 | 55 10 | : | 2 | • | 65 13 | |
| Mo. | 48 | 25 | 6 | 91 | 99 | 12 | 2 | 4 | 5 | |
| N. Dak. S. Dak. | 1 5 | 5 | 1 | 3 16 | 2 9 | - | : | - | 29 54 | |
| Nebr. | 12 | 7 | 2 | 4 | 11 | 2 | • | - | 5 | |
| Kans. | 6 | 4 | 2 | 22 | 16 | 1 | • | • | 10 | |
| S. ATLANTIC | 4,817 52 | 4,174 35 | 9 | 1,511 16 | 1,433 16 | 4 | 16 | 16 | 495 18 | |
| Del. Md. | 264 | 226 | ī | 161 | 124 | | 1 | 3 | 124 | |
| D.C. | 207 156 | 127 92 | - | 68 161 | 45 126 | 2 | 7 | : | 4 165 | |
| Va. W. Va. | 2 | 5 | - | 32 | 44 | - | <i>'</i> - | 1 | 37 | |
| N.C. | 277 213 | 229 270 | 5 | 109 158 | 143 140 | - | 1 | 10 2 | 24 | |
| S.C. Ga. | 791 | 585 | • | 224 | 207 | 1 | 2 | - | 86 | |
| Fla. | 2,855 | 2,605 | 3 | 582 | 588 | - | 5 | - | 37 | |
| E.S. CENTRAL | 738 | 753 | 12 | 553 | 614 | 4 | 2 | 4 | 119 | |
| Ky. Tenn. | 25 312 | 6 324 | 5 4 | 147 145 | 165 187 | 3 | 1 - | 2 | 55 32 | |
| Ala. | 215 | 192 | 3 | 180 | 186 | : | 1 | 2 | 32 | |
| Miss. | 186 | 231 | | 81 | 76 | 1 | - | - | - | |
| W.S. CENTRAL Ark. | 1,441 70 | 1,550 78 | 12 | 856 87 | 799 86 | 4 1 | 6 | 2 | 212 38 | |
| La. | 259 | 272 | : | 122 | 104 | - | 2 | - | - | |
| Okla. Tex. | 60 1,052 | 61 1,139 | 4 8 | 79 568 | 81 528 | 3 | 4 | 1 1 | 16 158 | |
| MOUNTAIN | 251 | 253 | 11 | 120 | 221 | 4 | 6 | 1 | 125 | |
| Mont. | 2 | 8 | - | | 8 | · | Ĭ | | 100 | |
| ldaho Wyo. | 1 | 1 | 2 | 2 1 | 16 1 | - | - | 1 | 10 | |
| Colo. | 33 | 41 | 1 | 8 | 43 | 3 | 3 | - | 1 | |
| N. Mex. Ariz. | 19 73 | 21 121 | 4 | 32 58 | 38 99 | 1 | 1 | - | 4 9 | |
| Utah | 9 | 9 | 4 | - | 6 | - | - | • | ĭ | |
| Nev. | 114 | 51 | - | 19 | 10 | - | - | - | - | |
| PACIFIC | 2,650 61 | 2,680 53 | 8 1 | 1,384 | 1,544 73 | - | 56 3 | 1 | 143 | |
| Wash. Oreg. | 104 | 99 | - | 78 47 | /3 43 | - | 5 | - | - | |
| Calif. | 2,465 | 2,521 | 7 | 1,187 | 1,330 | - | 46 | 1 | 139 | |
| Alaska Hawaii | 6 14 | 2 5 | - | 14 58 | 25 73 | - | 2 | - | 4 | |
| Guam | | 2 | - | 7 | 4 | - | | - | _ | |
| P.R. | 235 | 357 | - | 81 | 92 | - | 2 | - | 26 | |
| V.I. Amer. Samoa | 1 | 3 2 | | 3 | 2 | - | - | - | - | |
| C.N.M.I. | 1 | | - | 1 | - | - | - | - | - | |

TABLE IV. Deaths in 121 U.S. cities,* week ending May 14, 1988 (19th Week)

| Reporting Area All | | | | | | мау | 14, | 1988 | 3 (19th Week) | | | | | | | |
|---|-------------------------------|-----|--------|---------|-------|---------|-----|-------|-----------------------|----------------------------|-------|-------|-------|------|-----|-------|
| NEW ENGLAND 660 | | | All Ca | uses, B | y Age | (Years) | | P&I** | | All Causes, By Age (Years) | | | | | | |
| Boston, Mass. 171 95 38 21 8 9 18 Alfanta, Gls. 148 98 34 16 38 4 35 8 18 18 18 18 19 18 Alfanta, Gls. 148 18 18 18 18 18 18 18 18 18 18 18 18 18 | Reporting Area | | ≥65 | 45-64 | 25-44 | 1-24 | <1 | | Reporting Area | | ≥65 | 45-64 | 25-44 | 1-24 | <1 | Total |
| Bödden Berner 1 | | | | | | | | | S. ATLANTIC | 1,240 | 711 | 316 | 129 | 36 | 47 | 55 |
| Cambridge, Mess. 32 25 2 5 3 Chambridge, Mess. 32 22 5 5 3 Chambridge, Mess. 32 28 2 1 1 - 3 Chambridge, Mess. 32 38 3 1 1 | | | | | | | | | | 148 | 89 | | | 5 | 4 | 5 |
| Fall River, Mass. 60 37 14 4 3 4 4 Miami, Fila. 101 38 27 28 9 5 3 3 5 Loveli, Mass. 22 38 1 3 4 4 3 4 4 Miami, Fila. 101 38 27 28 9 5 5 3 5 5 2 Loveli, Mass. 22 16 3 1 3 4 | | | | | | | | - | | | | | | | | |
| Lorent Hasses. 15 | | | 28 | | 1 | | - | | | | | | | 5 | | 5 |
| Lynn, Mass. 15 14 - 1 - 1 - 1 1 1 1 1 1 1 1 | | | | | | | | 4 | Miami, Fla. | 101 | | 27 | 25 | 6 | 5 | 2 |
| New Bedford, Mass. 22 16 3 2 1 - 3 | | | | | | : | | 1 | | | | | | | 6 | 3 |
| New Payen, Lonn. 45 39 9 5 - 1 3 3 St. Petersburg, Fila. 61 46 13 1 - 1 1 - 1 1 - 1 1 1 1 1 1 1 1 1 1 | New Bedford, Mass. | | | | | 1 | - | - | | | | | | | | |
| Somerville, Mass. 59 5 3 1 1 - 7 - 1 | New Haven, Conn. | | | | | - | | 3 | St. Petersburg, Fla. | | | | 1 | - | | - |
| Springfield, Mass. 56 39 9 3 - 5 5 5 Wilmington, Del. 27 19 3 4 - 1 1 2 Worester, Mass. 67 45 15 3 1 3 5 E.S. CENTRAL 760 495 157 57 28 23 4 4 3 1 6 2 1 1 3 6 E.S. CENTRAL 760 495 157 57 28 23 4 4 3 1 6 2 1 1 3 6 E.S. CENTRAL 760 495 157 57 28 23 4 4 3 1 2 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 | Somerville, Mass. | | | | | - | | - | | | | | | | | |
| waterbury, Cohn. 29 19 6 2 1 1 1 3 3 ES.CENTRAL 760 495 157 57 28 23 44 44 MID. ATLANTIC 2,825 1,866 504 307 71 73 121 Chattanooga, Tenn. 68 47 16 4 - 1 7 1 7 1 1 2 2 2 2 - 1 | Springfield, Mass. | | | 9 | 3 | | 5 | 5 | | | | | | 4 | | |
| MID ATLANTIC 2,825 1,866 504 307 71 73 121 Chartanoga, Fenn. 68 47 16 4 - 1 77 Allenton, Paul Al | | | | | | | | | | | | | | 28 | | |
| Albartow, N.Y. 1.45 1.56 | | | | | - | | | - | Birmingham, Ala. | | | | | | | 3 |
| Allentown, Ps. 17 11 2 2 2 2 | | | | | | | | | Chattanooga, Tenn. | | | | | - | | 7 |
| Buffelo, N.Y. 100 63 20 8 4 2 13 Memphis, Tenn. 163 105 50 13 6 9 9 15 1 - Mobile, Ala. 53 33 32 14 6 6 1 - 1 1 | Allentown, Pa. | | | | 2 | | | | | | | | | | | |
| Elizabeth, N.J. 35 25 6 3 1 Montgomery, Ala. 53 38 8 4 1 - 5 5 Elie, Pa.† 44 35 5 1 3 - 6 Nashville, Tenn. 123 73 24 12 11 3 8 6 1 9 1 9 1 9 1 9 1 1 5 3 4 4 1 1 1 5 3 4 1 1 5 1 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | 63 | 20 | 8 | 4 | | 13 | | | | | | | 9 | 9 |
| Efie, Pa.† | | | | | | | | - | Mobile, Ala. | 53 | 32 | 14 | 6 | 1 | - | 1 |
| Jersey City, N.J. 1475 945 220 191 33 46 49 191 57 845 220 191 33 46 49 11 5 3 4 4 63 51 65 845 845 845 845 845 845 845 845 845 84 | Erie, Pa.† | | | | | | | 6 | Montgomery, Ala. | | | | | | 2 | |
| Newark N.J. 33 37 718 18 6 6 3 5 Austin. Tex. 72 49 11 5 3 4 4 4 7 1 2 1 1 8 | Jersey City, N.J. | | 29 | 7 | 8 | - | • | 1 | · · | | | | | | | |
| Paterson, N.J. 33 14 11 8 2 - 2 - 3 Baton Rouge, La. 38 23 10 2 3 - 3 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 9 9 15 Philadelphia, Pa. 412 276 76 42 9 2 1 4 Philadelphia, Pa. 412 276 76 42 9 15 Philadelphia, Pa. 412 276 77 8 Philadelphia, Pa. 412 276 77 8 Philadelphia, Pa. 42 14 Philadelphia, | N.Y. City, N.Y. Newark N I | | | | | | | | | | | | | | | |
| Philadelphia, Pa. 412 276 76 42 9 9 9 15 Corpus Christi, Tex.\$ 45 34 10 1 2 Pittsburgh, Pa.\$ 77 56 12 6 2 1 - Dallas, Tex.\$ 45 34 10 1 2 Pittsburgh, Pa.\$ 77 56 12 6 6 2 1 - Dallas, Tex.\$ 46 8 40 13 5 5 21 6 10 6 7 Reading, Pa.\$ 36 30 3 3 3 4 El Paso, Tex.\$ 68 40 13 5 4 6 7 Reading, Pa.\$ 36 20 2 9 1 5 Ellas, Tex.\$ 48 10 13 5 4 6 7 Reading, Pa.\$ 36 20 2 9 2 1 5 Ellas, Tex.\$ 308 176 74 34 13 11 7 Reading, Pa.\$ 130 24 8 1 Little Rock, Ark.\$ 56 21 13 13 6 6 3 5 5 Pixenton, Pa.\$ 133 24 8 1 Little Rock, Ark.\$ 56 21 13 13 6 3 5 5 Pixenton, Pa.\$ 137 27 6 1 2 1 5 Shreevport, Le.\$ 148 60 38 30 15 5 5 - Shreevport, Le.\$ 148 60 38 30 15 5 5 | | | | | | | | 5 | | | | | | | | 3 |
| Reading, Pa. 36 30 3 3 3 3 5 - | | | | 76 | 42 | | 9 | 15 | Corpus Christi, Tex.§ | | | | | : | | |
| Rochester, N.Y. 125 92 18 6 6 3 16 Fort Worth, Tex 75 44 15 8 5 3 5 5 Schenectady, N.Y. 21 17 4 1 1 Houston, Tex. 5 308 176 74 34 13 11 7 7 17 18 12 1 95 21 5 1 1 1 1 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 | Pittsburgh, Pa.† | | | | 6 | | | - | Dallas, Tex. | | | 55 | | | | |
| Schenectady, N.Y. 21 17 4 Houston, Tex. 5 308 176 74 34 13 11 7 7 | Rochester, N.Y. | | | | | | | | Fort Worth, Tex | | | | | | | 5 |
| Syracuse, N.Y. 121 95 21 - - 5 5 5 | Schenectady, N.Y. | 21 | 17 | 4 | - | | | | Houston, Tex.§ | 308 | | 74 | | | | 7 |
| Trenton, N.J. 37 27 6 1 2 1 5 San Antonio, Tex. 160 108 28 14 5 5 9 9 1016; A.Y. 17 15 2 1 5 Newsport, La. 28 22 4 1 1 1 3 Nonkers, N.Y. 33 20 10 2 1 1 5 Newsport, La. 28 22 4 1 1 1 3 Nonkers, N.Y. 33 20 10 2 1 1 5 Newsport, La. 28 22 4 1 1 1 3 Nonkers, N.Y. 33 20 10 2 1 1 5 Newsport, La. 28 22 4 1 1 1 3 Nonkers, N.Y. 33 20 10 2 1 1 1 Newsport, La. 28 22 4 1 1 1 3 Newsport, La. 299 1,489 521 161 5 4 74 100 Newsport, La. 299 1,489 521 161 5 Newsport, La. 28 22 4 1 1 1 3 14 Newsport, La. 28 22 4 1 1 1 3 14 Newsport, La. 299 1,489 521 161 5 Newsport, La. 28 22 4 1 1 1 3 14 Newsport, La. 299 1,489 521 161 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | | | 1 | - | : | - | | | | | | | | 5 |
| Utica, N.Y. 17 15 2 1 4 Tulsa, Okla. 119 80 25 9 2 3 14 Yonkers, N.Y. 33 20 10 2 1 - 4 Tulsa, Okla. 119 80 25 9 2 3 14 E.N. CENTRAL 2,299 1,489 521 161 54 74 100 Akron, Ohio 35 26 6 3 2 Tulsa, Okla. 119 80 25 9 2 3 14 Tulsa, Okla. 119 80 25 9 2 | | | 27 | | 1 | , | | 5 | | | | | | | 5 | 9 |
| E.N. CENTRAL 2,299 1,489 521 161 54 74 100 Akron, Ohio 63 42 14 4 1 2 Canton, Ohio 63 42 14 4 1 2 Akron, Ohio 35 26 6 3 | | | 15 | 2 | | - | | 1 | | | | | - | | | |
| Akron, Ohio 63 42 14 4 1 1 2 | • | | | | | | | | · · | | | | | | | |
| Canton, Ohio 35 26 6 3 1 - 4 Colo. Springs, Colo. 43 30 9 3 1 - 9 9 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 45 10 22 16 Chicago, Ill.5 584 382 125 20 Annual A | | | | | | | | 100 | | | | | | | | |
| Chicago, Ill.5 564 362 125 45 10 22 16 Incininati, Ohio 124 79 28 9 6 2 15 Incininati, Ohio 124 79 28 9 6 2 15 Incininati, Ohio 178 109 48 11 2 8 2 Incininati, Ohio 131 81 32 11 6 1 2 8 2 Incininati, Ohio 131 81 32 11 6 1 2 8 2 Incininati, Ohio 131 81 32 11 6 1 1 2 8 2 Incininati, Ohio 131 81 32 11 6 1 1 2 8 2 Incininati, Ohio 131 81 32 11 6 1 1 2 8 2 Incininati, Ohio 130 81 32 11 6 1 1 2 8 2 Incininati, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 130 82 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 8 2 Incinination, Ohio 131 81 32 11 6 1 1 2 Incinination, Ohio 131 81 32 11 6 Incinination, Ohio 131 81 32 11 1 6 Incinination, Ohio 132 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | | | | | - | Ā | | | | 29 | 3 | | - | |
| Cleveland, Ohio 178 109 48 11 2 8 2 2 2 1 1 1 Columbus, Ohio 131 81 32 11 6 1 1 - Phoenix, Ariz. 116 73 21 12 4 6 2 2 2 2 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | | 125 | 45 | 10 | 22 | 16 | | | | | | | | |
| Columbus, Ohio 131 81 32 11 6 1 - Phoenix, Ariz. 116 73 21 12 4 6 2 2 Dayton, Ohio 120 79 29 8 - 4 5 Phoenix, Ariz. 116 73 21 12 4 6 2 2 Dayton, Ohio 120 79 29 8 - 4 5 Phoenix, Ariz. 116 73 21 12 4 6 2 2 3 Dayton, Ohio 120 79 29 8 - 4 5 Phoenix, Ariz. 116 73 21 12 4 6 2 2 3 Dayton, Ohio 120 88 19 6 5 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 3 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 7 3 1 1 2 2 Salt Lake City, Utah 36 23 175 | | | | | | | | | Las vegas, Nev. | | 73 | | | 5 | 1 | |
| Dayton, Ohio 120 79 29 8 - 4 5 Pueblo, Colo. 25 18 2 1 3 1 1 1 Detroit, Mich. 246 149 62 16 9 10 5 Salt Lake City, Utah 36 23 7 3 1 2 3 Tucson, Ariz. 112 71 19 10 6 6 6 6 Fort Wayne, Ind. 53 26 17 3 4 3 2 PACIFIC 1,972 1,296 369 175 70 49 121 Grand Rapids, Mich. 57 45 10 - 1 1 1 2 Berkeley, Calif. 19 15 1 2 1 - 1 Indianapolis, Ind. 180 102 48 19 6 5 3 Berkeley, Calif. 19 15 1 2 1 - 1 Indianapolis, Ind. 180 102 48 19 6 5 3 Berkeley, Calif. 83 61 12 4 4 2 6 Milwaukee, Wis. 37 25 7 3 1 1 1 6 Milwaukee, Wis. 132 98 22 7 4 1 1 15 Peoria, Ill. 52 32 9 5 1 5 5 4 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Columbus, Ohio | | | | | | | 2 | | | | 21 | | 4 | 6 | |
| Evansville, Ind. 47 33 8 2 2 - 4 1 1 1 1 2 71 19 10 6 6 6 6 6 Fort Wayne, Ind. 53 26 17 3 4 3 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 1 2 1 1 3 3 2 1 1 2 1 1 3 3 2 1 1 2 1 1 3 3 2 1 3 1 1 3 1 3 | Dayton, Ohio | 120 | 79 | 29 | 8 | - | 4 | 5 | | | 18 | 2 | 1 | | 1 | 1 |
| Fort Wayne, Ind. 53 | | | | | 16 | 9 | | | | | 23 | | | | | |
| Gary, Ind. 24 11 10 3 2 Berkeley, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 1 Gary, Calif. 19 15 1 2 1 - 2 Gary, Calif. 19 15 1 2 1 - 2 Gary, Calif. 19 15 1 2 1 - 2 Gary, Calif. 19 15 1 2 1 - 2 Gary, Calif. 19 15 1 2 1 - 2 Gary, Calif. 19 15 1 2 G | | | | | | | | | 1 | | | | | | | |
| Grand Rapids, Mich. 57 45 10 - 1 1 1 2 Fresno, Calif. 61 Hondianapolis, Ind. 83 61 12 4 4 2 6 6 1 | Gary, Ind. | 24 | 11 | 10 | | - | - | 2 | | | | | | | 49 | |
| Madison, Wis. 37 25 7 3 1 1 6 Honolulu, Hawaii 31 20 4 1 - 2 Madison, Wis. 37 25 7 3 1 1 6 Honolulu, Hawaii 31 47 20 3 1 - 2 8 4 15 Los Angeles Calif. 103 67 24 6 2 4 10 25 31 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 13 17 80 25 <th< td=""><td></td><td></td><td></td><td></td><td>•</td><td></td><td></td><td></td><td>Fresno, Calif.</td><td>83</td><td>61</td><td></td><td></td><td>•</td><td>2</td><td>6</td></th<> | | | | | • | | | | Fresno, Calif. | 83 | 61 | | | • | 2 | 6 |
| Milwaukee, Wis. 132 98 22 7 4 1 15 Peoria, III. 52 32 9 5 1 5 4 Rockford, III. 54 37 12 2 1 2 7 South Bend, Ind. 37 28 6 1 1 1 1 7 South Bend, Ind. 37 28 6 1 1 1 1 7 South Bend, Ind. 37 45 8 4 1 Youngstown, Ohio 57 45 8 4 1 Bes Moines, lowa 79 50 17 5 2 5 4 Searamento, Calif. 136 93 23 13 4 1 12 Bes Moines, lowa 79 50 17 5 2 5 4 Sacramento, Calif. 136 93 23 13 4 1 12 Bes Moines, Iowa 79 50 17 5 2 5 4 Sacramento, Calif. 136 93 23 13 4 1 12 San Diego, Calif. 173 112 33 22 4 2 1 1 San Diego, Calif. 173 112 33 22 4 2 San Diego, Calif. 173 112 33 22 4 2 San Diego, Calif. 173 112 33 22 4 2 San Diego, Calif. 173 112 33 22 4 2 San Diego, Calif. 173 112 33 22 4 2 San Diego, C | | | | 48 7 | | | | | | | | | | - | - | |
| Peoria, III. 52 32 9 5 1 5 7 7 Rockford, III. 54 37 12 2 1 2 7 7 South Bend, Ind. 37 28 6 1 1 1 1 1 7 South Bend, Ind. 37 28 6 1 1 1 1 1 1 7 South Bend, Ind. 37 45 8 4 1 8 South Bend, Ind. 37 45 8 4 1 8 South Bend, Ind. 37 45 8 4 1 8 South Bend, Ind. 37 45 8 4 1 8 South Bend, Ind. 37 45 8 4 1 8 South Bend, Ind. 38 20 5 1 2 9 South Bend, Ind. 38 20 5 1 2 9 South Bend, Ind. 38 20 5 1 2 9 South Bend, Ind. 38 20 5 1 2 9 South Bend, Ind. 38 20 6 4 2 1 2 South Bend, Ind. 38 20 6 4 2 1 2 South Bend, Ind. 38 20 6 4 2 1 2 South Bend, Ind. 38 20 6 4 2 1 2 South Bend, Ind. 38 20 6 4 2 1 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 5 - 2 South Bend, Ind. 38 20 8 20 9 South Bend, Ind. 39 30 30 4 2 1 1 2 4 4 1 1 2 1 1 1 1 1 1 1 1 1 1 | Milwaukee, Wis. | 132 | 98 | 22 | 7 | | | | | | | | | | - | |
| South Bend, Ind. 37 28 6 1 1 1 1 1 1 Pasadena, Calif. 74 47 12 6 3 5 7 7 1 Toledo, Ohio 108 80 20 5 1 2 9 1 Pasadena, Calif. 39 30 4 2 1 2 4 1 2 4 1 2 5 1 1 2 9 1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 | | | | 9 | 5 | | | | Los Angeles Calif. | | | | | | | 17 |
| Toledo, Ohio 108 80 20 5 1 2 9 9 7 9 7 9 7 1 2 4 3 7 9 9 9 7 9 7 1 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2 1 2 | | | | | | | | | | | | 12 | 6 | 3 | 5 | 7 |
| Youngstown, Ohio 57 45 8 4 - - 1 Sacramento, Calif. 128 78 22 8 11 9 13 W.N. CENTRAL 804 545 166 48 18 27 41 San Diego, Calif. 136 93 23 13 4 1 12 San Diego, Calif. 173 112 33 22 4 2 1 2 San Francisco, Calif. 176 136 28 9 - 3 17 17 12 2 4 2 1 2 San Francisco, Calif. 176 136 28 9 - 3 17 17 17 13 2 4 2 1 2 San Jose, Calif. 176 136 28 9 - 3 17 2 2 4 2 1 3 Seattle, Wash. 129 88 27 6 4 4 3 5 <td< td=""><td></td><td></td><td>80</td><td>20</td><td></td><td></td><td></td><td></td><td>Portland Oreg</td><td></td><td></td><td></td><td>2</td><td></td><td>2</td><td></td></td<> | | | 80 | 20 | | | | | Portland Oreg | | | | 2 | | 2 | |
| W.N. CENTRAL 804 545 166 48 18 27 41 2 Des Moines, lowa 79 50 17 5 2 5 4 5 San Francisco, Calif. 136 93 23 13 4 1 12 Des Moines, lowa 79 50 17 5 2 5 5 2 5 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 San Francisco, Calif. 173 112 33 22 4 2 1 1 1 | Youngstown, Ohio | 57 | 45 | 8 | 4 | | | 1 | Sacramento, Calif. | | | | | | | |
| Duluth, Minn. 33 20 6 4 2 1 2 San Jose, Calif. 176 136 28 9 - 3 17 Kansas City, Kans. 36 22 9 5 - 2 2 Seattle, Wash. 129 88 27 6 4 4 3 Skansas City, Mo. 116 75 32 6 - 3 4 Lincoln, Nebr. 54 42 9 2 1 - 3 Minneapolis, Minn. 155 111 30 8 1 5 9 Minneapolis, Minn. 155 111 30 8 1 5 9 Santale, Wash. 38 26 4 5 3 - 2 Minneapolis, Mo. 118 77 27 4 3 7 4 3 7 4 St. Louis, Mo. 118 77 27 4 3 7 4 3 7 4 St. Louis, Mo. 158 41 10 4 1 2 1 | | | | | | 18 | | | San Diego, Calif. | | 93 | 23 | 13 | 4 | 1 | 12 |
| Kansas City, Kens. 36 22 9 5 - 2 2 Seattle, Wash. 129 88 27 6 4 4 3 Kansas City, Mo. 116 75 32 6 - 3 4 Spokane, Wash. 62 51 7 2 2 - 6 Lincoln, Nebr. 54 42 9 2 1 - 3 Tacoma, Wash. 38 26 4 5 3 - 2 Minneapolis, Minn. 155 111 30 8 1 5 9 Tacoma, Wash. 38 26 4 5 3 - 2 Minneapolis, Minn. 155 111 30 8 1 5 9 ToTAL 12,531 to 8,038 2,572 1,124 383 394 627 St. Louis, Mo. 118 77 27 4 3 7 4 St. Paul, Minn. 58 41 10 4 1 2 1 | Des Moines, Iowa | | | | | | | | | | | 33 | | 4 | | |
| Kansas City, Mo. 116 75 32 6 - 3 4 Spokane, Wash. 62 51 7 2 2 - 6 Lincoln, Nebr. 54 42 9 2 1 - 3 Tacoma, Wash. 38 26 4 5 3 - 2 Minneapolis, Minn. 155 111 30 8 1 5 9 TOTAL 12,531 ^{††} 8,038 2,572 1,124 383 394 627 St. Louis, Mo. 118 77 27 4 3 7 4 St. Paul, Minn. 58 41 10 4 1 2 1 | Kansas City. Kans | | | | | 2 | | | | | | | | 4 | | |
| Lincoln, Nebr. 54 42 9 2 1 - 3 Tacoma, Wash. 38 26 4 5 3 - 2 Minneapolis, Minn. 155 111 30 8 1 5 9 TOTAL 12,531 th 8,038 2,572 1,124 383 394 627 Omaha, Nebr. 86 57 16 8 5 - 8 St. Louis, Mo. 118 77 27 4 3 7 4 St. Paul, Minn. 58 41 10 4 1 2 1 | Kansas City, Mo. | 116 | 75 | 32 | 6 | - | | | Spokane, Wash. | 62 | 51 | 7 | 2 | 2 | - | 6 |
| Omaha, Nebr. 86 57 16 8 5 8 8 5 8 8 5 8 8 5 8 8 8 9 9 9 9 9 9 | | | | | 2 | | - | | | | | | | 3 | - | 2 |
| St. Louis, Mo. 118 77 27 4 3 7 4 St. Paul, Minn. 58 41 10 4 1 2 1 | | | | | 8 | | 5 | | TOTAL 1 | 12,531†† | 8,038 | 2,572 | 1,124 | 383 | 394 | 627 |
| St. Paul, Minn. 58 41 10 4 1 2 1 | | | | | | | 7 | | | | | | | | | |
| vvicnita, Kans. 69 50 10 2 3 4 4 | St. Paul, Minn. | 58 | 41 | 10 | 4 | 1 | 2 | 1 | | | | | | | | |
| | wicnita, Kans. | 69 | 50 | 10 | 2 | 3 | 4 | 4 | | | | | | | | |

^{*}Mortality data in this table are voluntarily reported from 121 cities in the United states, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

^{**}Pneumonia and influenza.

[†]Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

^{††}Total includes unknown ages.

[§]Data not available. Figures are estimates based on average of past available 4 weeks.

Consequently, drug abusers may be candidates for the vaccines against HAV that are currently being developed (5.6).

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Human Rabies - California, 1987

In December 1987, the first case of human rabies in the United States since May 1985 was diagnosed in San Francisco, California. The patient was a 13-year-old male immigrant; the diagnosis was made post-mortem.

The patient had no history of exposure to a rabid animal and had not traveled outside the United States since arriving from the Philippines in 1981. He had traveled outside San Francisco county (a county with no reported rabies in terrestrial animals) only twice in the previous year, once for a picnic on a San Mateo County beach in August 1987 and once for a 3-day camping trip to Sonoma County in northern California with 82 classmates and teachers in October 1987. The purpose of the camping trip was to identify wild animals, but, aside from a deer, a dead rabbit, and bats that were seen by two students, no animals were reported by the other students or listed in the patient's camping journal. Interviews with relatives, classmates, friends, and teachers did not identify any likely animal contact.

The patient was well until November 26, when he began experiencing painful lower back spasms. These symptoms progressed, and he was taken to an emergency room on November 28. He complained of shaking chills and pain in the penis, buttocks, and lower back. His neurological examination was normal, and he was afebrile, but his white blood cell (WBC) count was 20,200 (74% segmented neutrophils, 4% band neutrophils, 21% lymphocytes, and 1% monocytes). He was sent home with medication for the pain and spasms but returned the next day reporting priapism, abdominal pain, and pruritus that caused him to scratch his lower right abdomen. Opisthotonic posturing was precipitated by touching his penis or his back.

He was admitted to the hospital, with a differential diagnosis of pyelonephritis or appendicitis. On admission, his temperature was 38.3 °C (100.9 °F) rectally and his blood pressure was 150/90 mm Hg. Laboratory evaluation revealed a WBC count of 17,000/mm³ and a creatine phosphokinase (CPK) of 1,300 IU/mL (normal, 5–202). A urine toxic screen that was falsely positive for cocaine metabolites caused initial concern about drug ingestion. An exploratory laparotomy and appendectomy were performed; no abnormalities were found. Over the next 2 days, he became increasingly agitated. He complained of blurred vision and inability to move his legs, but

Human Rabies - Continued

examination revealed no focal neurological abnormalities. A psychiatric disorder was also considered because he had priapism and expressed great concern about recent pubertal changes.

Lumbar punctures, performed on November 30 and December 2, revealed no WBCs and normal protein levels (15 mg/dL on November 30 and 40 mg/dL on December 2). A computerized tomographic (CAT) scan of the head was normal; an electroencephalogram showed moderate diffuse slow wave activity. On December 2, he experienced episodes of hyperthermia (temperature as high as 41.7 °C [107.1 °F]), hypotension (blood pressure 54mm Hg systolic), hypoventilation (arterial blood, pCO₂ 55 mm Hg, pO₂ 78 mm Hg), bradycardia (heart rate, 40/min), and increased oral secretions (>1 liter/day). He became comatose, was intubated, and was transferred to a university hospital with a diagnosis of metabolic encephalopathy.

At the time of transfer, the patient had no corneal reflexes, but his doll's eye and gag reflexes were intact. The patient was examined for arthropod or other bite marks, but none were found. A lumbar puncture on December 3 revealed 52 mg/dL of protein (normal, 15–50) and 4 WBC/mm³ (21% polymorphonuclear leukocytes, 44% lymphocytes, 35% monocytes). Magnetic resonance imaging and CAT scans of the head revealed watershed infarcts. On December 8, a lumbar puncture showed a pleocytosis of 25 WBC/mm³ (21% polymorphonuclear cells, 40% lymphocytes, 39% monocytes) and protein of 53 mg/dL. His CPK, which had risen to 10,000 lU/mL, decreased to 600 lU/mL after treatment with diuretics and fluids. His peripheral WBC count ranged between 22,700/mm³ and 12,700/mm³. Despite vigorous supportive measures, the patient's condition deteriorated. He died on December 15, 19 days after onset of illness, with a diagnosis of encephalitis of unknown etiology.

On December 18, brain tissue was tested and found positive for rabies by fluorescent rabies antibody staining. Negri bodies were found subsequently, and rabies virus was isolated from brain tissue. The virus was typed by monoclonal antibodies (1,2). Its reactivity with a panel of monoclonal antibodies to rabies virus nucleocapsid and glycoprotein antigens distinguished it from variants associated with the disease in insectivorous bats in the United States but was identical to that of the virus from the skunk rabies enzootic in northern California.

Serum specimens collected on November 28 and December 9 were negative for rabies-neutralizing antibody, but a postmortem specimen collected on December 16 had a titer of 65,536 by the rapid fluorescent focus inhibition test. No antibodies were detected in cerebrospinal fluid (CSF) samples collected on November 30, December 2, and December 8. Rabies virus could not be isolated from the latter specimen.

Because of possible contact with the patient and his copious secretions, 12 family members and 75 of 177 health-care workers received rabies postexposure prophylaxis, at a cost of \$39,000 for the immune globulin and vaccinations. A questionnaire, designed to identify staff who had been exposed,* was administered to hospital, medical examiner, and transport staff. Twenty-five staff members reported exposures to patient's saliva and received rabies postexposure prophylaxis. Rabies postexposure prophylaxis was also administered to a number of other staff members whose exposure status was uncertain. None of three medical examiner's staff received vaccinations because isolation procedures (use of gowns, gloves, masks, and goggles) were followed during the autopsy.

^{*}Defined as contamination of an open wound or mucous membrane with saliva, other respiratory tract secretions, brain tissue, or CSF.

Human Rabies - Continued

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Editorial Note: The source of this child's exposure to rabies remains unknown. Including this case, nine cases of human rabies have been diagnosed in the United States since 1980. Three of the patients had been exposed to dogs in rabies-endemic countries outside the United States. The other six patients, including the one whose case is reported here, had no definite history of exposure to rabies (3–7). Three of these six cases were diagnosed post-mortem.

These six patients ranged from 5 to 27 years of age; four were 13 years of age or younger. Rabies virus could be isolated and typed by monoclonal antibodies from specimens from four of the patients. In two of the cases, the rabies variants were similar to those found in rabid insectivorous bats (4,6). Retrospective interviews with the family of one of these patients revealed that the patient was probably bitten by a bat 7 months before the onset of illness (4). Outside the United States, some cases involving patients with no reported exposure have been attributed to exposure to bats (8,9). The etiology of other cases cannot be determined (10). Cases of rabies involving persons with no known exposure have long puzzled investigators (10,11) and, with the decline in indigenous human rabies in the United States, now make up a larger proportion of the total.

In the current case and a previous one (5), the rabies variant was similar to that found in rabid terrestrial animals in the state where the patient lived, a finding that suggests that contact with rabid bats was not responsible for the disease. Although the patients' families and friends were interviewed in depth and could recall no possible exposures, the patients themselves could not be thoroughly questioned. It is possible that, as children, they might not have understood the danger of contact with some animals or might not have reported superficial exposures. Both cases involved children who had emigrated from rabies-endemic areas several years earlier,[†] a fact that raises the possibility of exposure in their country of origin. However, human rabies cases with incubation periods of a year or more are extremely rare (12). Unfortunately, monoclonal antibody typing cannot distinguish among the isolates from these two patients, variants found in some terrestrial wildlife epizootics (skunks in California and foxes in Texas [5]), and those found in dog rabies enzootic areas of Asia.

As in other cases of rabies, many of the early features of this patient's illness (fever, chills, back pain) were nonspecific and suggestive of many common infections (12,13). Although priapism has been previously reported as a presenting manifestation of rabies (14), its presence in a 13-year-old boy wary of recent pubertal changes and without signs or laboratory results compatible with more common causes of priapism (sickle cell anemia, chronic granulocytic leukemia, and spinal cord injury) presented a difficult diagnostic challenge. Other aspects of his illness, including abdominal pain, opisthotonic posturing, lability of temperature, pulse, and respiratory rate, have been more commonly noted in rabies cases (12). Although the normal CSF on two occasions may have further obscured the diagnosis, the cerebrospinal

[†]Seven years earlier for the patient whose illness is reported here and 4 years earlier for the other patient (5).

Human Rabies - Continued

fluid is frequently normal during the first week of illness and sometimes remains normal even later in the course of the disease (13).

Because human rabies is rare in developed countries, the diagnosis is especially difficult without an exposure history. The disease should be considered in the differential diagnosis of any person with rapidly progressive, unexplained encephalitis, even when no history of exposure to a rabid animal is given. Persons caring for such patients should avoid exposure to saliva and other potentially infectious materials.

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